europass

Pratush Kumar Pusti

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ABOUT ME

Third-year Life Sciences undergraduate with a hybrid skill set spanning experimental molecular biology and computational bioinformatics. Proficient in wet-lab techniques including PCR, bacterial cloning, and protein biochemistry, complemented by technical capabilities in Python, R, and Linux/Bash scripting. Passionate about systems biology and immunology, with a growing interest in neuroscience. Seeking an academic research position to leverage proficiency in both experimental workflows and algorithmic data analysis.

EDUCATION

BS-MS in Life Sciences NISER Bhubaneswar, Odisha, India. *Expected Graduation: 2028*

- **Current Year:** 3rd Year
- **Relevant Coursework:** Molecular Biology, Genetics, Bioinformatics, Biostatistics, Immunology, Biochemistry.

TECHNICAL SKILLS

Computational Biology & Data Analysis (Dry Lab)

- **Programming & Scripting:**
  - **Python:** Utilized for biological data analysis and manipulation using pandas and numpy. Experience implementing fundamental bioinformatics algorithms (e.g., Heuristic Motif Finding).
  - **Bash/Shell Scripting:** Strong command of the Linux/Unix environment; capable of writing Bash scripts for workflow automation and file processing.
- **Statistical Analysis:**
  - **R Language:** Proficient in statistical testing and data visualization using ggplot2.
  - **Statistical Methods:** Application of hypothesis testing including ANOVA, T-tests, and Chi-square analysis for biological datasets.
- **Bioinformatics Tools:**
  - Sequence alignment and homology search using BLAST.
  - Data retrieval and mining from primary databases (NCBI GenBank, UniProt, Ensembl).
- **Documentation:** Proficient in Markdown for technical documentation.

Laboratory Techniques (Wet Lab)

- **Molecular Biology:** Independent execution of DNA/RNA extraction, plasmid isolation, and bacterial cloning (transformation, plating, colony picking). Proficient in primer design and PCR setup (master mix calculation and thermal cycling optimization).
- **Protein Biochemistry:** Protein quantification using UV-Vis Spectrophotometry (Bradford Assay, NanoDrop) and protein separation via SDS-PAGE. Experience with Thin Layer Chromatography (TLC).
- **Cell Culture & Microscopy:** Aseptic handling of mammalian cell lines (experience with Breast Cancer lines), including media preparation and passaging. Proficient in compound light microscopy and sample preparation (Gram staining, Trypan Blue viability assays).
- **Immunoassays:** Practical application of ELISA for antigen/antibody detection and Flow Cytometry.

ACADEMIC RESEARCH EXPERIENCE

Bioinformatics Algorithm Development | *Coursework Project*

- **Objective:** Implemented fundamental bioinformatics algorithms to solve genomic challenges, utilizing the UCSD Bioinformatics curriculum framework.
- **Methodology:** Developed Python scripts to identify replication origins (*oriC*) and hidden regulatory motifs within DNA sequences. Utilized heuristic approaches for motif finding and Frequent Word problems.
- **Action:** Applied algorithms to the *E. coli* genome and synthetic datasets. Integrated AI-assisted coding tools to optimize script efficiency and debug logic.

Mammalian Cell Culture Techniques | *Laboratory Module*

- **Objective:** Acquired practical proficiency in the aseptic maintenance of mammalian cancer cell lines.
- **Methodology:** Handled MDA-MB-231 (Human Breast Cancer) cell lines under strict aseptic conditions.
- **Action:** Performed cell passaging, media replacement, and viability assessments. Conducted morphological analysis using compound light microscopy to monitor cell health and confluence.

RESEARCH INTERESTS

- **Molecular Systems Biology & Immunology:** Elucidating gene function and host-pathogen interactions through hybrid wet/dry lab approaches.
- **Structural Biology:** Protein chemistry, purification, and computational structure prediction.
- **Neuroscience & Metabolomics:** Physiological responses and neural metabolic pathways.